WHAT IS CLAIMED IS:

1. A solid-state imaging device in which a photodiode and a first transistor are provided in series between a ground and a drain in each pixel, and a signal corresponding to a current or an electric charge generated in the photodiode according to an optical input is outputted from a detection node located between the photodiode and the first transistor, comprising:

a control part that executes control to alternately repeat a logarithmic operation period during which a photoelectric conversion signal logarithmically converted by setting a gate voltage of the first transistor to a first level is obtained and a linear operation period during which a linear photoelectric conversion signal is obtained by setting the gate voltage of the first transistor to a second level.

2. The solid-state imaging device as claimed in claim 1, wherein

the photodiode and the detection node are connected to each other.

3. The solid-state imaging device as claimed in claim 1, wherein

a second transistor is connected between the photodiode and the detection node.

4. The solid-state imaging device as claimed in claim 3, wherein

the photodiode has a buried-channel structure.

5. The solid-state imaging device as claimed in claim 1, wherein

the control part executes control so as to

alternately repeat the logarithmic operation period and the linear operation period every frame,

read a potential of the detection node as a linear type signal immediately before a transition from the linear operation period to the logarithmic operation period, and

read the potential of the detection node as a logarithmic signal in the logarithmic operation period after a lapse of a certain period after the transition to the logarithmic operation period.

6. The solid-state imaging device as claimed in claim 5, comprising:

a first frame memory which stores a signal read from the detection node of each pixel in the logarithmic

operation period under a condition that light is irradiated to each pixel with a certain uniform intensity; and

a subtraction part which subsequently forms an output by subtracting the signal recorded in the first frame memory from a signal read in an arbitrary frame in association with each pixel.

7. The solid-state imaging device as claimed in claim 6, wherein

the subtraction part forms an output by subtracting the signal recorded in the first frame memory from a signal read in the logarithmic operation period in association with each pixel.

8. The solid-state imaging device as claimed in claim 5, comprising:

a second frame memory which records the signal read from the detection node every time immediately before the transition from the logarithmic operation period to the linear operation period under a subject imaging condition; and

a subtraction part which subtracts the signal recorded in the second frame memory from the signal read from the detection node immediately before the transition

from the linear operation period to the logarithmic operation period in association with each pixel.